Space Weather Forecast

Issued on Wednesday, 22 November 2023 at 12:52 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1 Radio Blackouts throughout. Chance of G1 Geomagnetic Storms, day 1 and day 4 (22 Nov and 25 Nov).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity has been observed with only C-class flares, the largest an upper end Common-class flare at 22/0628UTC, from the largest and most complex spot group located in the northeast.

There are currently ten sunspot groups on the disc, the majority of which are located in the eastern solar hemisphere. The aforementioned group in the northeast is surrounded by several simpler peripheral groups and has shown new development in its trailing southern portion, with a small but magnetically complex spot visible. All other spot groups are smaller and simpler, and appear either stable or in decay at present.

No Earth-directed CMEs observed in the past 24 hours. A CME observed off the eastern limb late UTC on 21 Nov was modelled and is directed behind the Earth orbit, with no significant impacts expected. Another CME was observed in coronagraph imagery off the southeast limb following a filament eruption, beginning around 22/0630UTC, and is being modelled. However, this also looks directed off the Sun-Earth line and is not anticipated to have any significant impacts.

Solar Wind / Geomagnetic Activity: Solar wind parameters have been indicative of a connection to a coronal hole high speed stream. Wind speeds rose from background to elevated levels. The interplanetary magnetic field was predominantly moderate, but has eased to weak levels in the past couple of hours. The important north-south component had several periods of consistently moderate southward orientation. Geomagnetic activity was largely Unsettled to Active, with G1/Minor Storm levels 22/0300-0900UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a daily Chance of Moderate class flares, mainly from current eastern solar hemisphere sunspot regions.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections currently feature in the forecast. Earth is currently connected to a coronal hole high speed stream. Elevated solar winds gradually easing back to slightly elevated or background through days 2-4 (23 to 25 Nov). No further enhancements expected until the possible arrival of another coronal hole later on day 4 (25 Nov).

Unsettled to Active with a Chance of a G1/Minor Storm is expected on Day 1 (22 Nov), gradually

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easing through days 2-4 (23-25 Nov) to become largely Quiet. The possible arrival of a coronal hole later on day 4 (25 Nov), brings a chance of G1/Minor Storm intervals to end the period.
Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	5	1	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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